NASA 2006 Safety and Health Managers Meeting
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Safety and Health Through Improved Exploration Planning

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Exploration Update

- Exploration Systems Architecture Study (ESAS) – 60 day study team (May to July 2005)
  - ESAS Architecture Requirements (Doc tree)
  - System Specification for the Exploration Architecture
    - CEV Technical Requirements
    - CLV Technical Requirements
    - Ground Support Systems/Facilities
  - Center S&MA supported ESAS working groups (CEV at JSC and CLV at MSFC) and coordinating S&MA requirements with Frank Bellinger
  - Identification of key technologies/reprioritize investments
- CEV Awards (2) Announced 6/13/05
- CEV Call for Improvements – RFP Released January 2006
  - Select one contractor by August 2006

Exploration Update

- Exploration Planning – about 180 billion dollars over the next 30 years with a condensed schedule, significant acquisition and critical decision making in early years
- Based on legacy Government programs, up front Safety, Reliability, Maintainability and Quality (SRM&Q) planning provides more than a 50 to 1 savings over the life of a program
- The best project, risk, schedule , cost, systems engineering and technical performance management in the world cannot replace adequate up front SRM&Q planning
- Most major corporations in the chemical, petroleum, pharmaceutical, and other hazardous industries call it “front-end loading”

Exploration Update

- SRM&Q Requirements are Critical to Customer Requirements and are Critically Inter-related
  - Quality Assurance Data Collection During Development, Processing, Flight and Ground Testing and Mission Execution is Critical in Providing a Closed-Loop System
  - Hazard Assessments, Fault Tree Analyses, Probabilistic Risk Assessments and other Analyses Assume Adequate Quality Control and Quality Assurance
  - Data Collection Definitions and Criteria Must Be Determined Early to Avoid Major Problems and Soaring Costs
- Constellation Systems have included OSMA in Reviews of various tools for Modeling and Analysis of Life Cycle Support Requirements Verification – Supportability, Maintainability, etc. such as Qualtech Systems Inc.
- OSMA Emphasized the Importance of Up-front Hazard and Failure Driven Design Decisions and Integrated Vehicle Health Autonomy

Exploration Update

- Any Proposal During the Various Trade Study Generation and Analysis Process Must Include the SRM&Q Interrelationships to be the Most Effective and Reduce Future Safety and Health Issues
  - Toxic Propellants Usage Requires More System Safety Analyses, Hazard Controls, Toxic Monitoring, SCAPE Suit Production and Maintenance, etc.
  - Quality Data on Hardware/Software Problems, Anomalies, and Trend Analyses of This Data Must be Planned as Part of any Integrated System. Data Mining Capability Must Also be Considered as Early As Possible
- Although ESMD Process for Trade Studies and Contractor Selection Has Been Rigorous, Detailed OSMA and SMA Community Analysis is Critical to Safety, Health and Mission Assurance
  - Contractors Providing COTS Software for any type of Data Collection and Decision Making System are not Familiar with NASA Requirements
  - Not Clear Whether Data Collection Software Engineers Have the Knowledge of the Critical Links Between Safety, Reliability, Maintainability, Quality and Technical Performance Requirements

SRM & Q Planning Activities with ESMD

- Supportability Meetings with ESMD Ground Support Systems (GSS) group continuing
  - Move to implement significant supportability requirements on new architecture (CEV / CLV)
  - Investigating potential software tools for supportability planning and reporting
- Mishaps/PRACA Discussions
- Worked Extensively over the Last 2 Years to Establish a Strong Multi-Layered Risk Management System in ESMD
- Worked to Inculcate the Risk Based Acquisition Management Approach to Contracting
- Emphasizing the Importance of Early Safety Studies to Support Design Trades – Joint Meetings with NESC on VAB SRM QD Updates to Support More SRM Segments
- Established an Integrated S&MA Team to Support NESC CEV Smart Buyer Project Plan Activities (Jan 23 to Mar 30, 2006)